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ABSTRACT

This study looked at patterns of relationship among motivational and effort variables for different classroom assessments, considering the assignment's interest and importance, students' self-efficacy for accomplishing the tasks, and the goal orientations and learning strategy use behind their efforts. A multiple case study design looked at the classrooms of 8 teachers (one for 2 years in a row) in 4 different schools (1 elementary, 1 middle, and 2 high schools) over 45 classroom assessments and 347 students. Relationships among motivational and effort variables were inspected according to a model that hypothesized the motivational and effort dynamics. This descriptive study is intended to identify what to look for in a path model when suitable data become available. (Contains 7 figures, 7 tables, and 25 references.) (SLD)

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# PATTERNS OF RELATIONSHIP AMONG MOTIVATIONAL AND EFFORT VARIABLES FOR DIFFERENT CLASSROOM ASSESSMENTS

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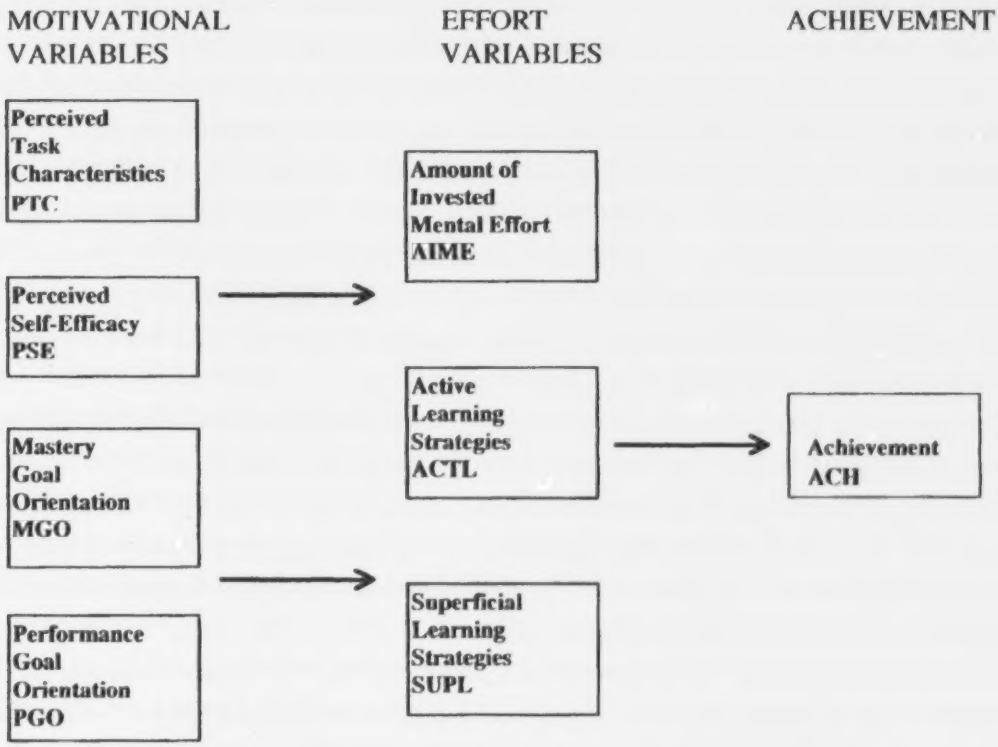
## PATTERNS OF RELATIONSHIP AMONG MOTIVATIONAL AND EFFORT VARIABLES FOR DIFFERENT CLASSROOM ASSESSMENTS

This study looked at patterns of relationship among motivational and effort variables for different classroom assessments: the assignment's interest and importance, students' self-efficacy for accomplishing the tasks, and the goal orientations and learning strategy use behind their efforts. A multiple case study design looked at eight teachers' classrooms, one for two years in a row, in four different schools. Relationships among motivational and effort variables were inspected according to the model in Figure 1. This descriptive work will help with decisions about what to look for in a path model when suitable data are available.

Figure 1.
***Hypothesized Motivation and Effort Dynamics for a Classroom Assessment Event***




The cognitive psychology literature identifies variables that are important to student motivation and learning. These variables may operate somewhat differently for each classroom assessment because both the group assignment and individual students' responses to it may differ, even in the same classroom assessment environment, from one assessment to another. First, one needs to consider that any classroom assessment event occurs within a particular **classroom assessment environment** (Brookhart,1997a; Haydel *et al.*, 1999; Stiggins & Conklin, 1992).

Thus, for example, an end-of-unit test presented after appropriate instruction in a supportive environment may be perceived differently and have different student responses than the same test presented after ambiguous lessons in a judgmental environment.

Within the classroom assessment environment, each assessment task is typically assigned to a group of students but perceived by each student individually. Each student's **perception of the importance and value of the assigned task** (Bergin, 1999; Brophy, 1999) and each student's perception of his or her ability to accomplish that particular task will affect effort (Salomon, 1983, 1984) and ultimately achievement (Gipps, 1994). The perceived importance, usefulness, and value of engaging in a task are motivators for student effort (Pintrich & Schrauben, 1992). Hidi and Harackiewicz (2000) found some evidence that student interest can be focused with situational factors (appealing material, "interesting" tasks); once interest is internalized, the student will continue to pursue mastery.

**Self-efficacy to do a task** refers to students' expectations that they can actually accomplish it. Self-efficacy therefore is profitably investigated at the level of individual tasks (Pajares, 1996), or individual classroom assessment events. Students will differ in their perceived self-efficacy to accomplish a task as they perceive it (Pintrich & Schrauben, 1992; Schunk, 1994; Weiner, 1979). Self-efficacy is associated with effort, persistence, and performance. Students make judgments about their own self-efficacy by comparing their past accomplishments with standards, either relative or absolute (Lepper, 1988; Schunk, 1994). To make these judgments, students must weigh task characteristics like difficulty, amount of effort required, and amount of assistance available against their perceptions of their past performances and accomplishments. Then they expend the effort to do the assessment.

Goal orientations characterize students' approaches to learning. Students with a **mastery goal orientation** place value on the learning itself, while students with a **performance goal orientation** place value on others' approval of their performance (Ames & Archer, 1988). More recently, theorists have divided performance goal orientations into two: performance-approach, wanting to be perceived as smart, wanting to outperform classmates, and so on; and performance-avoid, wanting to avoid failure or being seen as incompetent (Elliot & Covington, 2001). As did Meece and Miller (in press), this series of studies measured performance goals that focused on students' positive desires, that is, performance-approach goals.

Students who believe that they are capable of doing a task, and who want to learn the concepts or skill involved because they desire mastery, will not simply expend effort or try hard, but try "in a planful, strategic fashion" (Covington, 1992, p. 203). In this series of studies, separate variables were used to measure **amount of invested mental effort** (Salomon, 1983, 1984) or "trying" and use of **active learning strategies** and **superficial learning strategies** (Meece, Blumenfeld, & Hoyle, 1988). In a study of interrelationships among selected conative (motivational and volitional) constructs relevant to learning and performance, Jackson (1994) reported a high correlation between mindfulness, defined as the amount of invested mental effort and measured with Salomon's items, and a deep approach to learning. Meece and Miller (in press) found changes in task-mastery goal orientations explained variation in students' reported use of active learning strategies in reading and writing activities. Meyer, Turner, and Spencer (1997) found significant differences between challenge-seekers and challenge-avoiders in the use of surface

learning strategies, and marginally significant differences in the use of deep learning strategies. They also found significant differences between challenge-seekers and challenge-avoiders in mastery goal orientations, performance goal orientations, and self-efficacy.

## Method

### Participants

This study synthesizes evidence from five different studies. Data for the first study were collected in 1997-98 in an elementary school. The following year (1998-99), data were collected in the same elementary school, its adjoining middle school, and two different high schools in unrelated districts. All told, this synthesis represents data collected from 8 different teachers, in four different schools, over a total of 45 different classroom assessments and 347 students. The Appendix provides a list of the classroom assessment events for each teacher and grade level.

The elementary and middle schools were in a small urban district of 2,300 students; 62% of the elementary, and 55% of the middle school students were classified as low-income. In the third grade Language Arts classes were observed both years, for a total of 16 classroom assessment events (8 each year). In the fifth grade, English and Social Studies classes were observed, for a total of 9 classroom assessment events.

Two different high schools were studied, one in a suburban district and one in an inner-city location. The urban high school had 1,500 students, of whom 42% were classified as low-income, in a district of 40,000 students. One teacher's Social Studies classes were observed, for a total of 12 classroom assessment events (4 each in 3 different classes). The suburban high school had 990 students, of whom 5% were classified low income, in a district of 3,200 students. English and Anatomy classes were observed, for a total of 8 classroom assessments (5 English and 3 Anatomy) in two teachers' classrooms.

### Instrumentation

Seven scales measured the central constructs from the theoretical framework: Perceived Task Characteristics (PTC), Perceived Self-efficacy (PSE), Amount of Invested Mental Effort (AIME), Mastery Goal Orientations (MGO), Performance Goal Orientations (PGO), Active Learning Strategy Use (ACTL), and Superficial Learning Strategy Use (SUPL). They were constructed by modifying items from two extant instruments, the Motivated Strategies for Learning Questionnaire (MSLQ, Pintrich, Smith, Garcia & McKeachie, 1993) and the Student Activity Questionnaire (Meece, Blumenfeld, & Hoyle, 1988; Meece & Miller, in press). The primary difference between these instruments and the measures required for the present series of studies—and the reason for modifying to construct new instruments as opposed to using the extant ones—was the unit of reference. The items on both of these inventories are generic, and what was needed for this research agenda was a measure specific to an individual classroom assessment event, e.g., not "How hard do you try in school?" but "How hard did you try on the Revolutionary America test?"

Student responses to each item were made by circling choices on 5-point Likert scales. The choices were verbal; that is, the responses were from "YES!" to "NO!" or "Very much" to "Not at all" or other words that were appropriate as answers to the particular item. The numbers 1 to 5 were not printed on the students' version of the inventories; students simply circled the word or words that most closely matched their answers to the questions. To keep elementary and middle school students' surveys short, the learning strategies scales, Active Learning and Superficial Learning, were not included for the younger students. Table 1 presents median alpha values, which document the level of internal consistency reliability for each scale over its uses for each of the classroom assessment events in this study.

Table 1.
***Median Alpha Values (Internal Consistency Reliability) for Scales***

| Scale | Elementary Samples | High School Samples |
|---|---|---|
| PTC | .63 | .76 |
| PSE | .81 | .85 |
| AIME | .61 | .82 |
| MGO | .84 | .62 |
| PGO | .69 | .68 |
| ACTL | | .69 |
| SUPL | | .56 |

A pilot study used factor analysis to test construct validity (Brookhart, 1997b) with samples of college freshmen. Convergent and discriminant validity evidence for the scales as used in the 1997-1998 elementary school samples was described in Brookhart and DeVoge (1999). Convergent and discriminant validity evidence for the scales as used in the urban high school samples was described in Brookhart and Durkin (in press).

**Analysis**

A simple descriptive method was selected because of the nature of the data. Non-independent observations (the same students were observed for several assessments in each class) precluded using more advanced meta-analytic methods. Relationships among motivational and effort variables and achievement were examined one relationship at a time, across the eight teachers. Medians and distributions (boxplots) of the zero order Pearson product moment correlations among the variables were examined for each classroom assessment, to look for patterns by level (elementary, middle, high school) and by assessment type (paper and pencil test, performance assessment). There were a total of 28 boxplots, one for each relationship. To save space in this report, selected boxplots will be presented to illustrate conclusions. A printout of all 28 boxplots is available from the first author.

## Results

### Relationships Among Motivational Variables

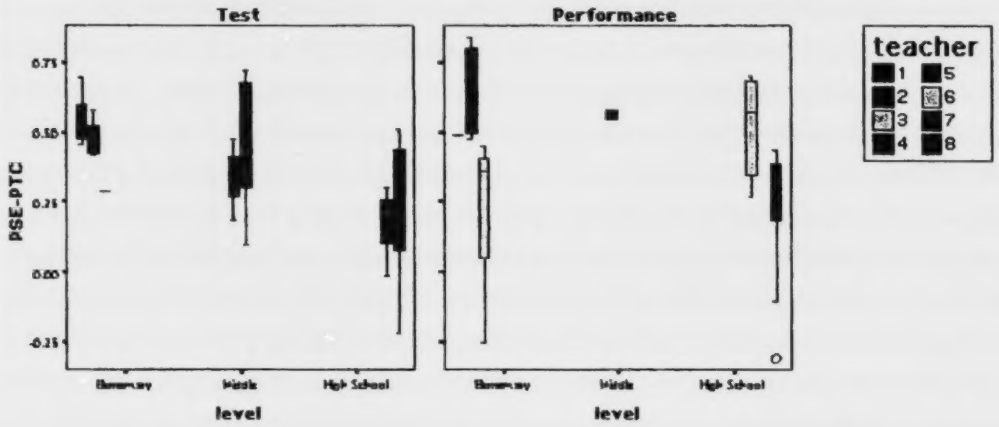
Table 2 presents median correlations among PTC, PSE, MGO, and PGO. Relationships among the motivational variables were positive overall. There is a pattern of decline in the strength of this positive relationship from elementary school through middle and high school. These relationships vary considerably with different assessments within cases (each teacher's classroom assessment environment). However, the pattern of decline by level is more consistent across cases for PTC-PGO, PTC-PSE, and MGO-PGO for tests, and more consistent across cases for PSE-MGO and PTC-MGO for performance assessments.

Table 2.
***Median correlations among motivational variables***

| Type of Assessment<br>Level | PSE-<br>PTC | MGO-<br>PTC | PGO-<br>PTC | MGO-<br>PSE | PGO-<br>PSE | PGO-<br>MGO |
|---|---|---|---|---|---|---|
| Test | | | | | | |
| Elementary | .47 | .71 | .59 | .42 | .20 | .61 |
| Middle | .48 | .65 | .26 | .28 | .11 | .20 |
| High School | .26 | .62 | .20 | .38 | .04 | .17 |
| Total | .43 | .65 | .25 | .31 | .14 | .20 |
| Performance Assessment | | | | | | |
| Elementary | .49 | .73 | .06 | .69 | .55 | .51 |
| Middle | .57 | .44 | .29 | .15 | .43 | .20 |
| High School | .32 | .44 | .30 | .14 | .04 | .44 |
| Total | .43 | .46 | .29 | .24 | .23 | .42 |
| Total | | | | | | |
| Elementary | .48 | .72 | .25 | .52 | .47 | .53 |
| Middle | .51 | .50 | .29 | .24 | .18 | .20 |
| High School | .30 | .46 | .26 | .27 | .04 | .39 |
| Total | .43 | .58 | .26 | .28 | .16 | .35 |

The boxplot of correlations of PTC-PSE by teacher (case) in Figure 2 shows this pattern. Notice that, while there is variability in this relationship from case to case, the pattern of decline in strength is clear for tests, while the variability among cases is foremost for performance assessments.

Figure 2.
***Boxplots of PTC-PSE for each case (teacher)***

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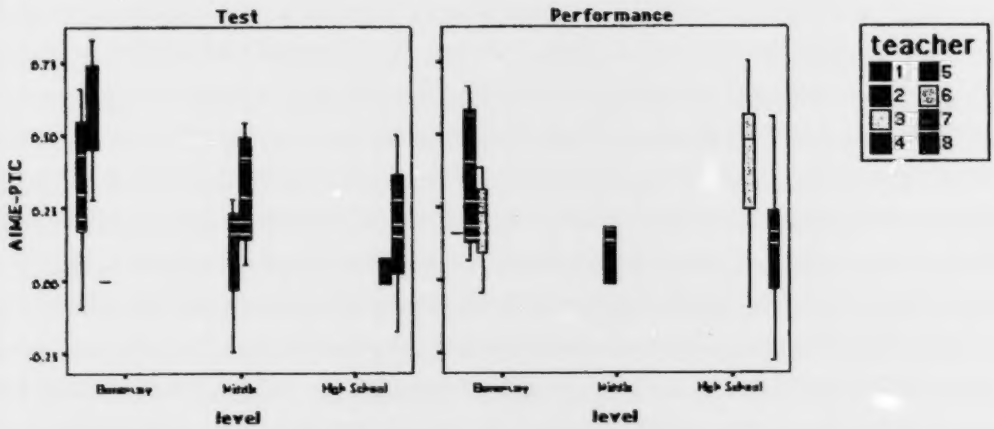
**Relationships Between Motivational and Effort Variables**

**All levels.** Table 3 presents median correlations between AIME and PTC, PSE, MGO, and PGO. These correlations were low positive overall, but very variable from teacher to teacher. Figure 3 gives an example to show this variability.

Table 3.
***Median correlations between motivational and effort variables***

| Type of Assessment<br>Level | AIME-PTC | AIME-PSE | AIME-MGO | AIME-PGO |
|---|---|---|---|---|
| Test | | | | |
| Elementary | .54 | .08 | .61 | .72 |
| Middle | .23 | .27 | .21 | .31 |
| High School | .08 | .05 | .03 | .24 |
| Total | .26 | .17 | .21 | .26 |
| Performance Assessment | | | | |
| Elementary | .21 | .23 | .15 | .56 |
| Middle | .09 | .04 | .04 | .08 |
| High School | .20 | .21 | .60 | .30 |
| Total | .19 | .23 | .41 | .29 |
| Total | | | | |
| Elementary | .34 | .17 | .52 | .64 |
| Middle | .18 | .25 | .12 | .14 |
| High School | .15 | .15 | .41 | .26 |
| Total | .23 | .22 | .38 | .27 |

Figure 3.
***Boxplots of PTC-AIME for each case (teacher)***

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**High School Cases Only.** Table 4 presents median correlations between the motivational variables PTC, PSE, MGO, and PGO and the effort variables ACTL and SUPL, which were measured only for the high school samples.

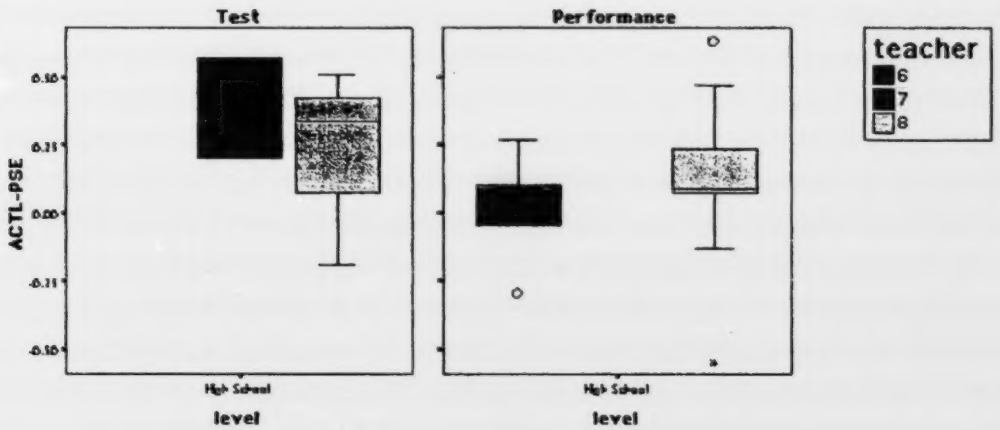
Correlations between motivational variables and ACTL were positive overall. The relationship ACTL-PSE was stronger for tests than for performance assessments. The relationship ACTL-PGO was stronger for performance assessments than for tests. Figure 4 presents the boxplots that illustrate how the ACTL-PSE relationship, stronger for tests than performance assessments, looks for each case.

Correlations between motivational variables and SUPL were negative overall except for SUPL-PGO, where there was no relationship. Correlations between SUPL-PTC and SUPL-PSE were stronger (more negative) for performance assessments than for tests.

Table 4.
***Median correlations between motivational and effort variables***
***High school samples only***

| | ACTL-PTC | ACTL-PSE | ACTL-MGO | ACTL-PGO | SUPL-PTC | SUPL - PSE | SUPL - MGO | SUPL - PGO |
|---|---|---|---|---|---|---|---|---|
| Test | .38 | .34 | .55 | .24 | -.02 | .03 | -.13 | -.05 |
| Perform. | .28 | .09 | .52 | .41 | -.16 | -.29 | -.15 | .08 |
| Total | .29 | .11 | .52 | .34 | .-15 | -.28 | -.13 | .06 |

Figure 4.
***Boxplots of PSE-ACTL for each case (teacher)***

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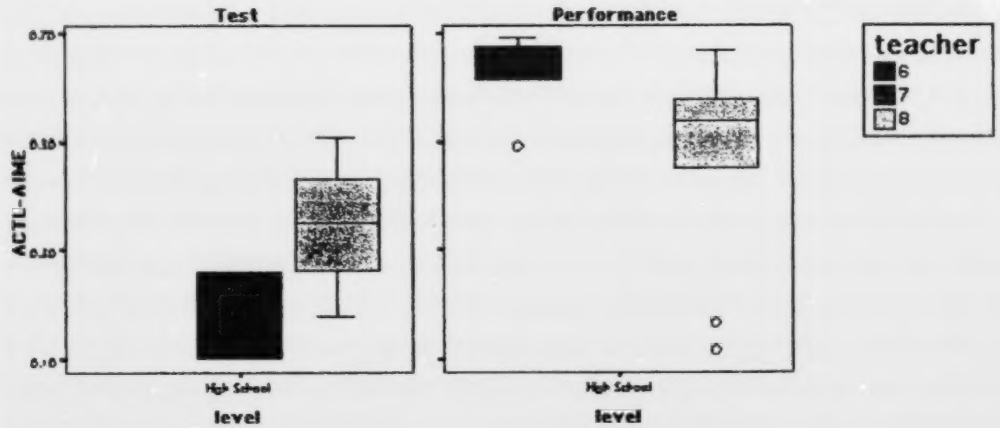
**Relationships Among Effort Variables (High School Level Only)**

Table 5 presents median correlations among the effort variables AIME, ACTL, and SUPL for the high school samples only. ACTL and SUPL displayed the same positive and negative correlations with AIME, respectively, as they did with the motivational variables in Table 3, and they were negatively related to each other. The relationship between AIME and both of these learning strategy uses was stronger for performance assessments than for tests. Figure 5 presents the boxplots that illustrate this pattern for AIME-ACTL for each case.

Table 5.
***Median correlations among effort variables***
***High school samples only***

| | ACTL-AIME | SUPL-AIME | ACTL-SUPL |
|---|---|---|---|
| Test | .26 | .06 | -.14 |
| Perform. | .58 | -.31 | -.20 |
| Total | .52 | -.31 | -.19 |

Figure 5.
***Boxplots of AIME-ACTL for each case (teacher)***




**Relationships Between Motivational Variables and Achievement on Classroom Assessments**

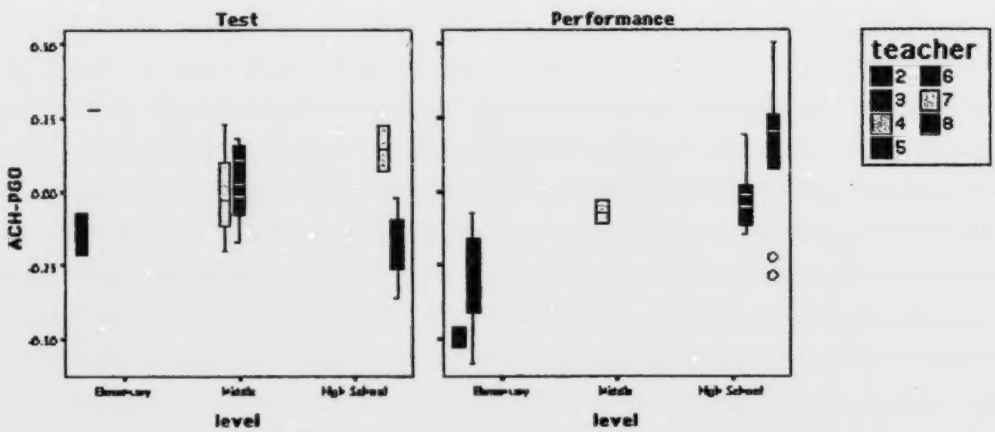
Table 6 presents median correlations between motivational variables and the actual achievement on the classroom assessments, the grades or scores the teachers assigned to the work. Notable

here is the lack of relationship, with the two exceptions. ACH-PSE for tests has a moderate positive relationship at all levels. ACH has a negative relationship with both measures of goal orientations for performance assessments at the elementary school level. Figure 6 illustrates this pattern with the boxplots for each case. The lack of relationships elsewhere may be due in part to a lack of variability in the classroom achievement scores.

Table 6.
***Median correlations between motivational variables and achievement on classroom assessments***

| Type of Assessment Level | ACH-PTC | ACH - PSE | ACH - MGO | ACH - PGO |
|---|---|---|---|---|
| Test | | | | |
| Elementary | .08 | .41 | -.07 | -.07 |
| Middle | .16 | .31 | -.01 | .02 |
| High School | .11 | .40 | .15 | -.02 |
| Total | .11 | .36 | .13 | -.02 |
| Performance Assessment | | | | |
| Elementary | -.17 | .09 | -.39 | -.46 |
| Middle | .39 | .02 | -.01 | -.07 |
| High School | .11 | .32 | .07 | .09 |
| Total | .09 | .18 | -.07 | -.06 |
| Total | | | | |
| Elementary | .02 | .28 | -.16 | -.23 |
| Middle | .17 | .27 | -.01 | -.03 |
| High School | .11 | .36 | .14 | .07 |
| Total | .10 | .32 | .04 | -.03 |

Figure 6.
***Boxplots of ACH-PGO for each case (teacher)***



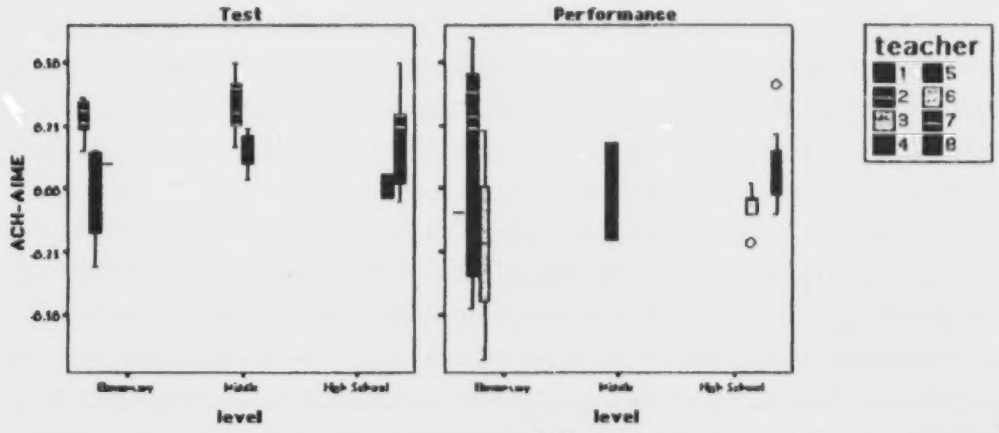
**Relationships Between Effort Variables and Achievement on Classroom Assessments**

Table 7 presents median correlations between effort variables and student achievement on classroom assessments. Relationship between ACH and AIME is low positive for tests, and essentially zero for performance assessments. ACH has a weak positive relationship to ACTL for performance assessments and a weak negative relationship to SUPL for both tests and performance assessments in the high school samples. Figure 7 presents the boxplots for the ACH-AIME relationship for each case. These boxplots illustrate a large amount of variability in this relationship for performance assessments in the elementary school samples.

Table 7.
***Median correlations between effort variables and achievement on classroom assessments***

| Type of Assessment<br>Level | ACH-AIME | ACH - ACTL | ACH - SUPL |
|---|---|---|---|
| Test | | | |
| Elementary | .15 | | |
| Middle | .18 | | |
| High School | .06 | .07 | -.22 |
| Total | .15 | .07 | -.22 |
| Performance Assessment | | | |
| Elementary | -.15 | | |
| Middle | -.01 | | |
| High School | .01 | .19 | -.17 |
| Total | -.03 | .19 | -.17 |
| Total | | | |
| Elementary | .12 | | |
| Middle | .18 | | |
| High School | .02 | .15 | -.19 |
| Total | .08 | .15 | -.19 |

Figure 7.
***Boxplots of ACH-AIME for each case (teacher)***



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## Discussion

Before beginning the discussion, let the reader remember that observations were not independent. Medians were affected in part by the representation of teachers, students, subjects and assessments in the data available. Therefore no firm conclusions, causal or otherwise, are warranted. The purpose of this descriptive study was to summarize available information from this series of studies of small samples in order to develop hypotheses and plan analyses for a study designed with larger sample sizes, independent observations, and therefore the possibility of using path analysis.

Where correlations were variable, one might hypothesize that teacher – or classroom assessment environment – makes a difference. Where correlations were consistent across cases, one might hypothesize that the relationship is more robust to differences in classroom assessment environments. Where correlations were consistent for tests but not for performance assessments, or vice versa, one might hypothesize that teachers can make more of a difference for one kind of assessment than for the other. Of course these differences could be related to subject, too, or out of the teachers' control. In some teachers' classes (cases), it was tempting to "read in" some patterns, for example it was tempting to postulate a climate of striving in one of the elementary classes, at least metaphorically. Additional study is required to establish whether and to what extent classroom assessment environment differences are systematic and explainable, and to what extent test/performance assessment differences are systematic and explainable.

A summary of findings from this descriptive study suggests additional study with a path analysis is warranted. Zero-order relationships are weak but consistent, suggesting that more complex relationships may better explain covariation. For example, perceived self-efficacy may have direct relationships with achievement for tests, but a mediated relationship with achievement for performance assessments (see Table 6). General relationships described across the eight cases in this study may be summarized as follows.

- Correlations among **motivational variables** were positive and showed a pattern of declining in strength over time. This was clearer in relationships involving MGO for performance assessments, and clearer in relationships involving PTC for tests.
- Correlations between **motivational and effort variables** were positive and weak (negative and weak for SUPL) and variable by teacher. Some relationships were stronger for tests than performance assessments (ACTL-PSE). Some relationships were stronger for performance assessments than for tests (ACTL-PGO, SUPL-PTC, SUPL-PSE).
- Correlations among **effort variables** were positive and weak (negative and weak for SUPL). The relationship of AIME to both active and superficial learning strategy use was stronger for performance assessments than for tests.
- Correlations between **motivational variables and achievement** were essentially zero, possibly because of low variability in achievement. There were a couple exceptions to the pattern of no relationship. ACH-PSE was moderate and positive, and the correlations between achievement and both mastery and performance goal orientations were negative for performance assessment at the elementary level.
- Correlations between **effort variables and achievement** were weak (negative for SUPL).

A summary of zero-order relationships finds that, in general, the amount of variability in relationships from one assessment to another for the same teacher (classroom assessment environment) varies from teacher to teacher and, for some relationships, between tests and performance assessments. Some relationships were more robust than others: mastery goal orientations was the most consistent in this regard, always positively associated with perceptions of the importance of the task and with the use of active learning strategies no matter what the context. Competing hypotheses suggest themselves. It may be that great variability from assessment to assessment in the relationships among motivational and effort variables and achievement suggests a lax, judgmental or ineffective classroom assessment environment. It may be that this variability is more benign and related to different approaches to creating a classroom assessment environment.

The fact that zero-order relationships are weak but consistent also suggests that unmeasured variables exist. One such unmeasured variable is surely prior level of achievement or ability with the general topic area of the classroom assessment. The next study in this series will include a measure of prior achievement.

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## Appendix

### Classroom Assessment Events, by Teacher, Subject, and Grade Level

### Classroom Assessment Events in Elementary School, Third Grade Language Arts

**Teacher #1, Language Arts, 1997-98, female teacher, 18 students**

Spelling test (20-word lesson with sentences)
Mean performance = 90.67%, sd = 10.31

Vocabulary test (oral test and workbook page)
Mean performance = 95.83%, sd = 7.52

Verbs in predicates worksheet
Mean performance = 85.44%, sd = 11.05

Story map (comprehension test on "Chameleon Was a Spy" from reader)
Mean performance = 89.00%, sd = 8.67

**Teacher #2, Language Arts, 1997-98, female teacher, 15 students**

Spelling test (review lesson with 35 words)
Mean performance = 92.50%, sd = 9.55

Story map (comprehension test on story "Pecos Bill Rides the Tornado" from reader)
Mean performance = 90.00%, sd = 11.95

Language test (correct sentences from board)
Mean performance = 87.20, sd = 10.60

Written paragraph about obedience, using the writing process
Mean performance = 87.33%, sd = 8.84

**Teacher #2, Language Arts, 1998-99, 13 students**

Pecos Bill adventure paragraph (write how you would have reacted to one of the three adventures you read) – Mean performance (4-point rubric) = 3.08, sd = .49

Meaningful sentence test (write 5 meaningful sentences for vocabulary words)
Mean performance = 94.00%, sd = 6.76

Story test (comprehension test on story "Rachel's Journey" from reader)
Mean performance = 77.00%, sd = 10.82

Language test (correct errors in sentences)
Mean performance = 89.92%, sd = 4.76

**Teacher #3, Language Arts, 1998-99, female teacher, 16 students**

Pecos Bill adventure paragraph (write how you would have reacted to one of the three adventures you read) – Mean performance = 84.31%, sd = 10.03

Story test (comprehension test on story "Eliza's Daddy" from reader)
Mean performance = 91.79%, sd = 7.29

Spelling test (20-word unit test given on St. Patrick's day with answer sheet to color)
Mean performance = 92.81, sd = 7.95

Story test (comprehension test on story "Legend of Bluebonnet" from reader)
Mean performance = 82.88%, sd = 10.41

**Classroom Assessment Events in Middle School,1998-99, Fifth Grade**

**Teacher #4, Social Studies, female teacher, 28 students**

Middle Colonies test (unit test from textbook)
Mean performance = 88.93%, sd = 10.96

Role play, "We protest!" (group development & presentation of skit about peaceful protest to British regarding unfair taxation)
Mean performance (4-point rubric) = 3.71, sd = .50

**Teacher #4, Math, 25 students**

Geometry cartoon ("state-test-like" performance, draw a figure using geometric shapes)
Mean performance (5-point rubric) = 4.88, sd = .60

Unit test on 1-digit division, finding averages, solving equations
Mean performance = 81.96%, sd = 13.02

**Teacher #5, Social Studies, female teacher, 21 students**

Middle Colonies test (unit test from textbook)
Mean performance = 75.95%, sd = 18.93

Pre-revolutionary and French/Indian War test (unit test from textbook)
Mean performance = 71.52%, sd = 16.46

**Teacher #5, Math, 19 students**

Unit test on 1-digit division, finding averages, solving equations
Mean performance = 58.89%, sd = 22.13

Unit test on fractions and mixed numbers
Mean performance = 67.11%, sd = 18.58

**Classroom Assessment Events in Suburban High School, 1998-99**

**Teacher #6, 11th Grade honors English, female teacher, 41 students in 2 classes**

I-Search paper (research an original topic of personal interest, using informal sources, including family interviews)
Mean performance = 3.89 on the ABCDF scale where A=4/F=0, sd = .19

Hypothesis paper on the novel *Out of This Furnace* (identify an apparent contradiction in the novel, forwarded an hypothesis about the reason, supported with evidence)
Mean performance = 3.46 on the ABCDF scale where A=4/F=0, sd = .67

Literary Analysis paper (prepare a conventional analysis of an author, a work, or a set of works, using the skills of literary criticism and secondary sources)
Mean performance = 3.49 on the ABCDF scale where A=4/F=0, sd = .68

**Teacher #6, 10th Grade English, 17 students**

I-Search paper (research an original topic of personal interest, using informal sources, include family interviews)
Mean performance = 2.86 on the ABCDF scale where A=4/F=0, sd = 1.03

Poetry writing project (write a set of original poems according to assigned forms)
Mean performance = 3.06 on the ABCDF scale where A=4/F=0, sd = 1.34

**Teacher #7, 12th Grade Anatomy elective, male teacher, 53 students in 3 classes**

Skeleton Lab Practical (identif7 bones or parts of bones at stations around the lab)
Mean performance=92.02%, s=17.69

Muscle Cell Contraction test (multiple-choice test on the chemistry and physiology of muscle cell contraction)
Mean performance=84.10%, s=9.63

Muscle Lab Practical (identify muscles and their functions at stations around the lab)
Mean performance=90.76%, s=9.98

**Classroom Assessment Events in Urban High School, 1998-99, Social Studies, Teacher #8, Male Teacher**

**U.S. History, 11th Grade honors track, 26 students in 2 classes**

Revolutionary America test (paper and pencil, individual exam)
Mean performance=75.96%, s=14.98

Events Leading to the Civil War Comic Book (performance assessment, group project)
Mean performance, 17.84 on a 20-point rubric scale, s=3.38

"History Game" of events 1877-1900 (performance assessment, group project, student-written rubrics) -- Mean performance=95.52%, s=8.49

Evaluating JFK Project (performance assessment, group project, student-written rubrics)
Mean performance=93.86%, s=19.64

**Philosophy, 12th Grade elective, 15 students**

Early Philosophers test (paper and pencil, individual exam)
Mean performance=96.50%, s=4.46

Philosopher Presentations (performance assessment, group project)
Mean performance=12.60 on a 15-point rubric scale, s=1.92

Hinduism Presentations (performance assessment, group project, student-written rubrics)
Mean performance=95.77%, s=4.00

Current Issue Presentation (performance assessment, group project, student-written rubrics)
Mean performance=80.71%, s=17.74

**World Cultures, 10th Grade, 40 students in 2 classes (70 enrolled)**

Renaissance quiz (paper and pencil, individual quiz)
Mean performance=65.25%, s=16.17

Hobbes/Locke Conversation (written performance [imaginary conversation that Hobbes and Locke might have had if they discussed the American revolution], individual assignment)
Mean performance=18.44 on a 25-point rubric scale, s=4.74

Industrial Age Game (performance assessment, group project, student-written rubrics)
Mean performance=77.30%, s=33.43

World War II Timeline (performance assessment, individual assignment, student-written rubrics)
Mean performance=82.32%, s=17.10

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